

# PATENT COOPERATION TREATY

REC'D 14 JUN 2005

From the  
INTERNATIONAL SEARCHING AUTHORITY

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To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY  
(PCT Rule 43bis.1)

Date of mailing  
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference  
see form PCT/ISA/220

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
PCT/US2004/042663

International filing date (day/month/year)  
17.12.2004

Priority date (day/month/year)  
30.12.2003

International Patent Classification (IPC) or both national classification and IPC  
G01N29/02, G01N29/22, G01N29/24, H01L41/047, H03H9/05, H05K3/32, H01L21/60

Applicant  
3M INNOVATIVE PROPERTIES COMPANY

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

## 2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



European Patent Office  
D-80298 Munich  
Tel. +49 89 2399 - 0 Tx: 523656 epmu d  
Fax: +49 89 2399 - 4465

Authorized Officer

Uttenhaller, E

Telephone No. +49 89 2399-7568



**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
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**Box No. I Basis of the opinion**

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1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
  - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material:
    - ☐ a sequence listing
    - ☐ table(s) related to the sequence listing
  - b. format of material:
    - ☐ in written format
    - ☐ in computer readable form
  - c. time of filing/furnishing:
    - ☐ contained in the international application as filed.
    - ☐ filed together with the international application in computer readable form.
    - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

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**Box No. II Priority**

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1. ☒ The validity of the priority claim has not been considered because the International Searching Authority does not have in its possession a copy of the earlier application whose priority has been claimed or, where required, a translation of that earlier application. This opinion has nevertheless been established on the assumption that the relevant date (Rules 43bis.1 and 64.1) is the claimed priority date.
2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43bis.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.
3. Additional observations, if necessary:

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

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**Box No. V Reasoned statement under Rule 43b/s.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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**1. Statement**

Novelty (N)	Yes: Claims	1-23
	No: Claims	
Inventive step (IS)	Yes: Claims	4, 8-18
	No: Claims	1-3,5-7, 19-23
Industrial applicability (IA)	Yes: Claims	1-23
	No: Claims	

**2. Citations and explanations**

**see separate sheet**

**Re Item V.**

**1. Cited documents**

The following documents are referred to in this communication:

- D1:** US-B1-6 287 894 (SAWIN RAYMOND L) 11 September 2001 (2001-09-11)
- D2:** US-B1-6 556 105 (NGUYEN NGOC-TUAN ET AL) 29 April 2003 (2003-04-29)
- D3:** PATENT ABSTRACTS OF JAPAN vol. 1997, no. 10, 31 October 1997 (1997-10-31) & JP 09 162693 A (KOKUSAI ELECTRIC CO LTD), 20 June 1997 (1997-06-20)
- D4:** EP-A-0 840 369 (KABUSHIKI KAISHA TOSHIBA) 6 May 1998 (1998-05-06)
- D5:** WO 03/098206 A (FORSCHUNGSZENTRUM KARLSRUHE GMBH; RAPP, MICHAEL; VOIGT, ACHIM) 27 November 2003 (2003-11-27)
- D6:** RAPP M ET AL: "New miniaturized SAW-sensor array for organic gas detection driven by multiplexed oscillators" SENSORS AND ACTUATORS B, ELSEVIER SEQUOIA S.A., LAUSANNE, CH, vol. 65, no. 1-3, 30 June 2000 (2000-06-30), pages 169-172, XP004208629 ISSN: 0925-4005
- D7:** DU J ET AL: "Love wave acoustic immunosensor operating in liquid" SENSORS AND ACTUATORS A, ELSEVIER SEQUOIA S.A., LAUSANNE, CH, vol. 61, no. 1-3, June 1997 (1997-06), pages 279-286, XP004092233 ISSN: 0924-4247

**2. Inventive Step (Art. 33(3) PCT)**

Claims 1 and 19 do not appear to fulfill the requirements of the PCT set out in Article 33(3) with respect to an inventive step:

**Claim 1:**

D1 discloses a surface acoustic wave device assembly comprising:  
a surface acoustic wave device (10, 14 and 16, fig. 1, D1) comprising a plurality of electrodes (18, fig. 1, D1);  
a circuit layer (22, fig. 3, D1) a plurality of electrical contacts (24, fig. 3, D1); and  
a Z-axis conductive layer to couple the electrical contacts to the electrodes (28, fig. 3

and col. 5, lines 42-52, D1).

Thus, the subject-matter of claim 1 differs from D1 in that the surface acoustic wave device is a sensor and in that the circuit layer includes an aperture.

The problem to be solved by the present invention may therefore be regarded as adapting the design of the surface acoustic wave device for sensing purposes.

The skilled person who knows that the physical principle of surface acoustic wave devices is the same in e.g. electronic filtering of sensing applications and he would know that a surface acoustic wave device that is not encapsulated would sense changes in the ambient conditions as e.g. temperature. He would solve the technical problem posed by providing access to the sensing part of the surface acoustic wave device. He would, therefore provide an aperture in the circuit layer, so that the sensing part of the surface acoustic wave device can be exposed to the fluid or material under investigation.

He would thus arrive at the subject matter of claim 1 without involving an inventive step.

Therefore, **claim 1 is not inventive.**

**Claim 19:**

It appears that the **above objections to claim 1 equally apply, mutatis mutandis, to the corresponding method claim 19.**

Therefore, **claim 19 is not inventive.**

**The same objections against an inventive step of claims 1 and 19 could have been raised starting with D2, D3 or D4.**

**Dependent claims:**

The dependent claims 2, 3, 5-7 and 20-23 appear to relate to mere design modifications, consequential features, conventional features or features already

present in the arrangement of D1 to D4 and, therefore, do not appear to contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT with respect to an inventive step.

3. **Claim 8 appears to fulfill the requirements of the PCT set out in Article 33(2) and Article 33(3) with respect to novelty and an inventive step in the light of documents D1 to D4.**

Claims 9 to 18, depending on claim 8 as such also fulfill the requirements of the PCT with respect to novelty and an inventive step.

4. **Miscellaneous**

- a. The prior art D1 to D4 is not identified in the description and the relevant background art disclosed therein not briefly discussed (Rule 5.1a(ii) PCT).
- b. The independent claims are not in the two-part form (Rule 6.3(b) PCT) with those features known in combination from the prior art being placed in the preamble (Rule 6.3(b)(I) PCT) and with the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).
- c. The features of the claims are not provided with reference signs placed in parentheses to increase the intelligibility of the claims (Rule 6.2(b) PCT).